



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

M

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/052,538	01/23/2002	Tetsunori Kaji	520.35237VX3	4015
20457	7590	02/05/2004	EXAMINER	
ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-9889			CROWELL, ANNA M	
		ART UNIT	PAPER NUMBER	
		1763		

DATE MAILED: 02/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/052,538	KAJI ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Michelle Crowell	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 17 November 2003.
- 2a) This action is **FINAL**.      2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 37-45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 37-45 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. §§ 119 and 120

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) All    b) Some \* c) None of:  
1. Certified copies of the priority documents have been received.  
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 13) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) The translation of the foreign language provisional application has been received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Objections*

1. Claim 41 is objected to because of the following informalities: In line 2 the term "et" should be "set". Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 37, 40, and 44-45 are rejected under 35 U.S.C. 102(b) as being anticipated by Ohmi (U.S. 5,272,417).

Referring to Figure 1, column 6, line 25-column 7, line 6, and column 8, line 61-68,

Ohmi discloses a plasma processing apparatus comprising: a vacuum processing chamber 105 (col. 6, lines 27-28), a pair of plate electrodes 102, 104 opposite to each other, one of the electrodes 104 being used also as a sample table capable of holding a sample containing an insulator film (col. 6, lines 25-27, col. 12, lines 12-15), a gas introducing means capable of introducing a fluorine-containing etching gas into the vacuum processing chamber (col. 6, lines 30-31, col. 8, lines 65-66), and a plasma generating means 111 for forming the introduced gas into a plasma (col. 6, line 68-col. 7, line 5), wherein: an electrode cover 101, including means for removing fluorine, comprising a material containing Si or C is disposed at the other of the

Art Unit: 1763

pair of plate electrodes (col. 6, lines 33-43), a pressure in the environment between the pair of flat plate electrodes is set to 0.933 Pa (col. 8, line 25), a high frequency electric power of 100 MHz –250 MHz is applied to the other of the electrodes (col. 8, lines 23-27, col. 4, lines 31-33), and a gap between the plate electrodes is set to 30 mm (col. 8, line 24).

With respect to claim 40 depending on claim 37, Ohmi discloses a plasma processing apparatus wherein a bias 110 is further applied in addition to the high frequency electric power to the other of the electrodes (col. 6, lines 62-68).

Regarding the limitation of “fluorine-containing etching gas”, the type of gas used in apparatus claims is considered intended use and therefore is of no significance in determining patentability. Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim. Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969). Furthermore, the apparatus of Ohmi is capable of providing a fluorine containing etching gas to the sample.

Regarding the limitation of “a pressure condition of 0.5 Pa to 4.0 Pa”, this is considered intended use and therefore is of no significance in determining patentability. The apparatus of Ohmi is capable of providing a pressure condition of 0.5 Pa to 4.0 Pa.

Regarding the limitation of “an insulator film in the sample”, this is considered intended use and therefore is of no significance in determining patentability. The inclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims.” In re Young, 75 F.2d 966, 25 USPQ 69 (CCPA 1935) (as restated in In re Otto, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963). Moreover, the apparatus of Ohmi is capable of processing an insulator film in the sample.

Art Unit: 1763

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 38, 40, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohmi (U.S. 5,272,417).

Ohmi fails to explicitly teach the diameter of the sample being 300 mm or more; however, it is still obvious. According to *In Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. Thus, it would have been obvious to one of ordinary skill in

Art Unit: 1763

the art at the time of the invention to scale up/down the apparatus of Ohmi in order to process a sample with a diameter of 300 mm or more.

With respect to claim 40 depending on claim 38, Ohmi discloses a plasma processing apparatus wherein a bias 110 is further applied in addition to the high frequency electric power to the other of the electrodes (col. 6, lines 62-68).

With respect to claim 41 depending on claim 38, Ohmi discloses a plasma processing apparatus according to claim 38, wherein the gap between the pair of plate electrodes is set to 30 mm or more (col. 8, lines 23-24).

6. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohmi (U.S. 5,272,417) in view of Sakamoto et al. (U.S. 5,698,062).

The teachings of Ohmi have been discussed above.

Ohmi fails to teach a gas diffusion plate.

Referring to column 5, lines 21-35, Sakamoto et al. teaches a plasma processing apparatus wherein the gas introducing means 26, 21 has a gas diffusion plate 24. It is well known in the art for the upper electrode to include a gas introducing means having a gas diffusion plate in order to uniformly distribute process gases. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the upper electrode of Ohmi with a gas introducing means having a gas diffusion plate as taught by Sakamoto et al. in order to uniformly distribute process gases.

7. Claims 42-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohmi (U.S. 5,272,417) in view of Ishii (U.S. 5,529,657).

The teachings of Ohmi have been discussed above.

Ohmi fails to teach a susceptor cover.

Referring to Figures 3-6 and column 4, line 49 – column 5, line 12, Ishii teaches a plasma processing apparatus comprising a susceptive cover 6 comprised of carbon or silicon located adjacent to one of the pair of electrodes 31 (col. 4, lines 50-54, col. 5, lines 9-12). The susceptor cover 6 has a thickness of 2 mm (col. 4, lines 63-65). The susceptor cover directs the plasma to the surface of the wafer. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide one of the pair of electrodes of Ohmi with the susceptor cover as taught by Ishii in order to direct the plasma to the surface of the wafer.

8. Claims 37-41 and 44-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto et al. (U.S. 5,698,062) in view of Ohmi (U.S. 5,272,417).

Referring to Figure 1, column 4, line 55 – column 6, line 18, Sakamoto et al. discloses a plasma processing apparatus comprising: a vacuum processing chamber 2, a pair of plate electrodes 21 and 5 opposite to each other, one of the electrodes 5 being used also as a sample table capable of holding a sample containing an insulator film (col. 4, lines 55-58, col. 6, lines 16-18), a gas introducing means 26 having a gas diffusion plate 24 for introducing a fluorine-containing etching gas into the vacuum processing chamber (col. 5, lines 30-35), a plasma generating means 51 for forming the introducing gas into a plasma, a pressure in the environment between the pair of flat plate electrodes is set to 1.33 Pa to 39.99 Pa (col. 5, lines 36-45), a high frequency electric power of 10-100 MHz is applied to the other of the electrodes (col. 6, lines 12-15), and a gap between the electrodes between 15 mm and 20 mm (col. 5, lines 20-21).

Art Unit: 1763

Sakamoto et al. fails to teach an electrode cover.

Referring to Figure 1 and column 6, lines 25-43, Ohmi teaches a plasma processing apparatus having an electrode cover 101, including means for removing fluorine, comprising a material containing Si or C which is disposed at the other of the pair of plate electrodes (col. 6, lines 33-43). The electrode cover 101 is applied to prevent etching of the electrode. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the upper electrode of Sakamoto et al. with the electrode cover as taught by Ohmi in order to prevent etching of the electrode.

Sakamoto et al. in view of Ohmi fails to explicitly teach the sample having a diameter of 300 mm or more; however, it is still obvious. According to *In Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to scale up/down the apparatus of Sakamoto et al. in view of Ohmi in order to process a sample with a diameter of 300 mm or more.

Additionally, with respect to claim 40, Sakamoto et al. teaches a plasma processing apparatus wherein a bias 41 is further applied in addition to the high frequency electric power to the other of the electrodes (col. 5, line 58-col. 6, line 6).

Sakamoto et al. fails to teach an electrode gap set to 30 mm or more.

Art Unit: 1763

Referring to column 8, line 24, Ohmi teaches a plasma processing apparatus wherein a gap between the plate electrodes is set to 30 mm (col. 8, line 24). It is well known in the art to select an electrode gap to enhance processing conditions, i.e. improved processing rates. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to for the electrode gap of Sakamoto et al. to be set to 30 mm as taught by Ohmi in order to enhance processing conditions, i.e. improved processing rates.

Regarding the limitation of “fluorine-containing etching gas”, the type of gas used in apparatus claims is considered intended use and therefore is of no significance in determining patentability. Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim. *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969). Furthermore, the apparatus of Sakamoto et al. in view of Ohmi is capable of providing a fluorine-containing etching gas to the sample.

Regarding the limitation of “a pressure condition of 0.5 Pa to 4.0 Pa”, this is considered intended use and therefore is of no significance in determining patentability. The apparatus of Sakamoto et al. in view of Ohmi is capable of providing a pressure condition of 0.5 Pa to 4.0 Pa.

Regarding the limitation of “an insulator film in the sample”, this is considered intended use and therefore is of no significance in determining patentability. The inclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims.” *In re Young*, 75 F.2d 966, 25 USPQ 69 (CCPA 1935) (as restated in *In re Otto*, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963)). Moreover, the apparatus of Sakamoto et al. in view of Ohmi is capable of processing an insulator film in the sample.

Art Unit: 1763

9. Claims 42-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto et al. (U.S. 5,698,062) in view of Ohmi (U.S. 5,272,417) as applied to claims 37-40 and 44-45 above, and further in view of Ishii (U.S. 5,529,657).

The teachings of Sakamoto et al. in view of Ohmi have been discussed above.

Sakamoto et al. in view of Ohmi fails to teach a susceptor cover.

Referring to Figures 3-6 and column 4, line 49 – column 5, line 12, Ishii teaches a plasma processing apparatus comprising a susceptive cover 6 comprised of carbon or silicon located adjacent to one of the pair of electrodes 31 (col. 4, lines 50-54, col. 5, lines 9-12). The susceptor cover 6 has a thickness of 2 mm (col. 4, lines 63-65). The susceptor cover directs the plasma to the surface of the wafer. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide one of the pair of electrodes of Sakamoto et al. in view of Ohmi with the susceptor cover as taught by Ishii in order to direct the plasma to the surface of the wafer.

#### *Response to Arguments*

10. Applicant's arguments with respect to claims 37-45 have been considered but are moot in view of the new ground(s) of rejection.

#### *Conclusion*

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 1763

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Crowell whose telephone number is (571) 272-1432. The examiner can normally be reached on M-F (8:00 - 4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (571) 272-1439. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

AMC *gmc*  
January 30, 2004

*Gregory Mills*  
SU ANDREW PATHWAGNER  
TECHNOLOGY CENTER 1700